

**LYs Doc**

# 1 Introduction

## Why a MusicXML test suite?

This test suite of sample MusicXML (<http://www.musicxml.org/>) files is supposed to fill a severe gap for all developers implementing MusicXML support in their application: There is no complete test suite of MusicXML files available for testing purposes.

## Downloading the test suite

The complete set of MusicXML test files contained in this suite can be downloaded here ([MusicXML-TestSuite-0.1.zip](#)) as a ZIP archive.

## License of the test suite

This collection of MusicXML test files is distributed under the MIT license (<http://www.opensource.org/licenses/mit-license.php>), which means that you can use the files for any purpose, as long as you leave the copyright notice (or the LICENSE file) intact.

## Connection with LilyPond (<https://lilypond.org/>)

At the same time as providing a generic test suite for MusicXML document, this test suite also serves as proofs for the `musicxml2ly` script provided with LilyPond dev. The images shown in the Chapter 2 [Test cases], page 4, chapter were generated by running `musicxml2ly` and `lilypond` on the MusicXML files. As `musicxml2ly` does not yet perfectly support every single aspect of MusicXML, the output is not supposed to be used as a definitive reference rendering, but rather as an indication how one particular application supports and interprets each of the test files.

If something does not seem right in the output, it might either be that this feature has not been implemented yet, has been wrongly implemented, or a regression has crept in recently...

In the web version of this document, you can click on the file name or figure for each example to see the corresponding `.ly` intermediary file.

## Structure of this test suite

Each test file (typically hand-crafted from the MusicXML "specification") checks one particular aspect of MusicXML. A short description of the particular feature for a file is given element inside the file in a comment element of the form:

```
<identification><miscellaneous>
  <miscellaneous-field name="description"> .... </miscellaneous-field>
</miscellaneous></identification>
```

The files are categorized by their first two digits with the following meaning:

- 01-03 ... Basics: Pitches, Rests, Rhythm
- 11-13 ... Staff attributes: Time signatures, Clefs, Key signatures
- 21-24 ... Note settings: Chorded notes, note heads, tuplets, grace notes
- 31-33 ... Notations and articulations: Dynamics (staff-attached), Notations (note-attached), Spanners
- 41-44 ... Parts: Multiple parts, multi-voice parts, multi-staff parts
- 45-46 ... Measure issues and repeats
- 51-52 ... Page issues: Header fields, page layout
- 55-59 ... Exact positioning of items, offsets, etc.

- 61-69 ... Vocal music
- 71-75 ... Instrument-specific: Guitar (Chord, fretboards), Transposing instruments, Percussion, Figured Bass, Others
- 81-89 ... MIDI generation (all sound-related issues)
- 90-99 ... Various Other: Compressed MusicXML files, compatibility with broken MusicXML files exported by other applications

Some of the categories (in particular the exact item positioning and the MIDI generation) don't have any test cases yet.

## 2 Test cases

### 01 ... Pitches

All pitches from G to c'' in ascending steps; First without accidentals, then with a sharp and then with a flat accidental. Double alterations and cautionary accidentals are tested at the end.

01a-Pitches-Pitches.xml

### Pitches and accidentals

The musical score consists of four staves of music in treble clef, 4/4 time. The first staff starts with a common time signature 'C' and shows a sequence of notes ascending from G4 to c''5. The second staff starts at measure 8 and continues the sequence with various accidentals (sharps and flats) and double alterations. The third staff starts at measure 14 and continues the sequence with cautionary accidentals. The fourth staff starts at measure 20 and continues the sequence with cautionary accidentals and ends with a double bar line.

All pitch intervals in ascending jump size.

01b-Pitches-Intervals.xml

### Various pitches and interval sizes

The musical score consists of two staves of music in treble clef, 2/4 time. The first staff starts with a 2/4 time signature and shows a sequence of notes with various interval sizes and accidentals. The second staff starts at measure 11 and continues the sequence with various interval sizes and accidentals.

The <voice> element of notes is optional in MusicXML (although Dolet always writes it out). Here, there is one note with lyrics, but without a voice assigned. It should still be correctly converted.

01c-Pitches-NoVoiceElement.xml

1. A

Some microtones: c flat-and-a-half, d half-flat, e half-sharp, f sharp-and-a half. Once in the lower and once in the upper region of the staff.

01d-Pitches-Microtones.xml

Accidentals can be cautionary or editorial. Each measure has a normal accidental, an editorial, a cautionary and an editorial and cautionary accidental.

01e-Pitches-ParenthesizedAccidentals.xml

Microtone accidentals can be cautionary or editorial. Each measure has a normal accidental, an editorial, a cautionary and an editorial and cautionary accidental.

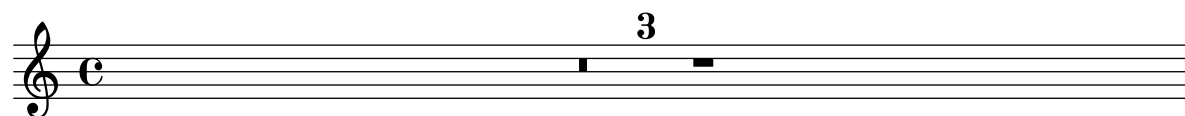
01f-Pitches-ParenthesizedMicrotoneAccidentals.xml

## 02 ... Rests

All different rest lengths: A two-bar multi-measure rest, a whole rest, a half, etc. until a 128th-rest; Then the same with dotted durations.

02a-Rests-Durations.xml

### Rest unit test



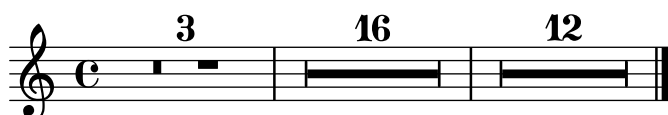
Rests can have explicit pitches, where they are displayed. The first rest uses no explicit position and should use the default position, all others are explicitly positioned somewhere else.

02b-Rests-PitchedRests.xml



Four multi-measure rests: 3 measures, 15 measures, 1 measure, and 12 measures.

02c-Rests-MultiMeasureRests.xml



Multi-Measure rests should always be converted into durations that are a multiple of the time signature.

02d-Rests-Multimeasure-TimeSignatures.xml



In some cases, a rest might not have its type attribute set (this happens, for example, with voices in Finale, where you don't manually insert a rest).

02e-Rests-NoType.xml



### 03 ... Rhythm

All note durations, from long, brevis, whole until 128th; First with their plain values, then dotted and finally doubly-dotted.

03a-Rhythm-Durations.xml

The image shows three staves of musical notation in treble clef, 4/4 time. The first staff starts at measure 16 and ends at measure 24. It contains a whole note, a dotted half note, and a sequence of eighth notes that become increasingly dense. The second staff starts at measure 24 and ends at measure 28. It contains a dotted whole note, a dotted half note, and a sequence of eighth notes that become increasingly dense. The third staff starts at measure 28 and ends at measure 32. It contains a doubly-dotted whole note, a doubly-dotted half note, and a sequence of eighth notes that become increasingly dense.

Two voices with a backup, that does not jump to the beginning for the measure for voice 2, but somewhere in the middle. Voice 2 thus won't have any notes or rests for the first beat of the measures.

03b-Rhythm-Backup.xml

The image shows a single staff of musical notation in treble clef, common time (C). It contains a quarter note, a quarter note, and a quarter note, with a backup symbol (a vertical line with a horizontal bar) indicating a change in the division of the quarter note.

Although uncommon, the divisions of a quarter note can change somewhere in the middle of a MusicXML file. Here, the first half measure uses a division of 1, which then changes to 8 in the middle of the first measure and to 38 in the middle of the second measure.

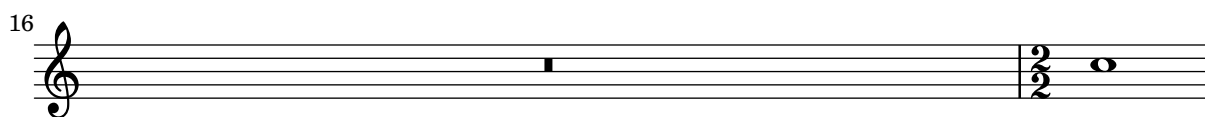
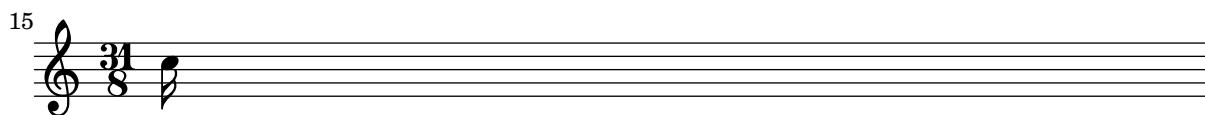
03c-Rhythm-DivisionChange.xml

The image shows a single staff of musical notation in treble clef, common time (C). It contains a quarter note, a quarter note, a quarter note, and a quarter note, with a backup symbol (a vertical line with a horizontal bar) indicating a change in the division of the quarter note.

Several durations can be written with dots. For multimeasure rests, we can also have durations that cannot be expressed with dotted notes (like 5/8).

03d-Rhythm-DottedDurations-Factors.xml

The image shows two staves of musical notation in treble clef. The first staff starts at measure 1 and ends at measure 5. It contains a quarter note, a multimeasure rest for 2 measures, a quarter note, a multimeasure rest for 2 measures, a quarter note, a multimeasure rest for 2 measures, and a quarter note. The second staff starts at measure 5 and ends at measure 9. It contains a quarter note, a multimeasure rest for 2 measures, a quarter note, a multimeasure rest for 2 measures, a quarter note, a multimeasure rest for 2 measures, and a quarter note.



## 11 ... Time signatures

Various time signatures: 2/2 (alla breve), 4/4 (C), 2/2, 3/2, 2/4, 3/4, 4/4, 5/4, 3/8, 6/8, 12/8  
 11a-TimeSignatures.xml



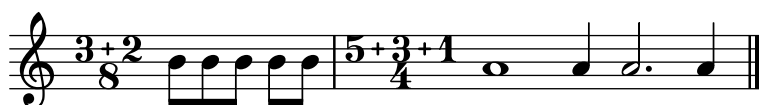
A score without a time signature (but with a key and clefs)

11b-TimeSignatures-NoTime.xml



Compound time signatures with same denominator:  $(3+2)/8$  and  $(5+3+1)/4$ .

11c-TimeSignatures-CompoundSimple.xml



Compound time signatures with separate fractions displayed:  $3/8+2/8+3/4$  and  $5/2+1/8$ .

11d-TimeSignatures-CompoundMultiple.xml



Compound time signatures of mixed type:  $(3+2)/8+3/4$ .

11e-TimeSignatures-CompoundMixed.xml



A time signature of 3/8 with the symbol="cut" attribute and two symbol="single-number" attributes with compound time signatures. Shall the symbol be ignored in this case?



11f-TimeSignatures-SymbolMeaning.xml



Time signature displayed as a single number.

11g-TimeSignatures-SingleNumber.xml



Senza-misura time signature

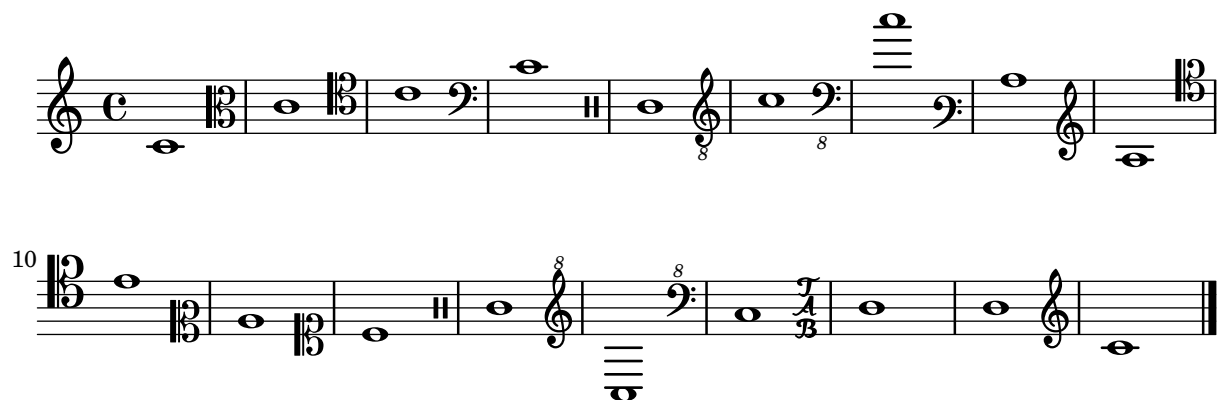
11h-TimeSignatures-SenzaMisura.xml



## 12 ... Clefs

Various clefs: G, C, F, percussion, TAB and none; some are also possible with transposition and on other staff lines than their default (e.g. soprano/alto/tenor/baritone C clefs); Each measure shows a different clef (measure 17 has the "none" clef), only measure 18 has the same treble clef as measure 1.

12a-Clefs.xml



A score without any key or clef defined. The default (4/4 in treble clef) should be used.

12b-Clefs-NoKeyOrClef.xml



### 13 ... Key signatures

Various key signature: from 11 flats to 11 sharps (each one first one measure in major, then one measure in minor)

13a-KeySignatures.xml

### Different Key signatures

The image displays 11 staves of musical notation, each representing a different key signature. The notation is in treble clef and 2/4 time. The first five staves (measures 1-15) show key signatures with 11 flats: C major (no sharps or flats), C minor (one flat), D minor (two flats), E minor (three flats), and F minor (four flats). The next five staves (measures 16-30) show key signatures with 11 sharps: F major (one sharp), G major (two sharps), A major (three sharps), B major (four sharps), and C major (no sharps or flats). The final staff (measures 31-42) shows the C major key signature (no sharps or flats) with various accidentals (sharps and flats) placed on the notes to represent different modes.

All different modes: major, minor, ionian, dorian, phrygian, lydian, mixolydian, aeolian, and locrian; All modes are given with 2 sharps.

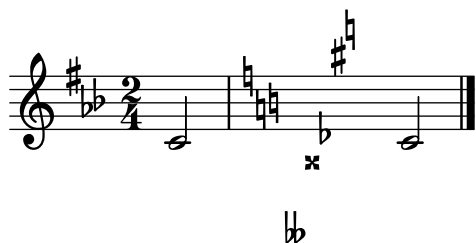
13b-KeySignatures-ChurchModes.xml

The image shows a single staff of musical notation in treble clef and common time (C). The key signature has two sharps (F# and C#). The notes are C, D, E, F#, G, A, B, C, representing the first mode (C major).

1. major minor ionian dorian phrygian lydian mixolydian aeolian locrian

Non-traditional key signatures, where each alteration is separately given. Here we have (f sharp, a flat, b flat) and (c flatflat, g sharp sharp, d flat, b sharp, f natural), where in the second case an explicit octave is given for each alteration.

13c-KeySignatures-NonTraditional.xml



Non-traditional key signatures with microtone alterations: (g flat-and-a-half, a flat, b half-flat, c natural, d half-sharp, e sharp, f sharp-and-a-half).

13d-KeySignatures-Microtones.xml



## 14 ... Staff attributes

The number of staff lines can be modified by using the staff-lines child of the staff-details attribute. This can happen globally (the first staff has one line globally) or during the part at the beginning of a measure and even inside a measure (the second part has 5 lines initially, 4 at the beginning of the second measure, and 3 starting in the middle of the third measure).

14a-StaffDetails-LineChanges.xml

Two parts of music. Part 1 is on a single-line staff in treble clef with a common time signature (C). It contains three measures, each with a whole note G4. Part 2 is on a two-line staff in treble clef with a common time signature (C). It contains three measures: the first measure has a whole note G4 on the bottom line, the second measure has a whole note A4 on the bottom line, and the third measure has a whole note B4 on the bottom line.

## 21 ... Chorded notes

One simple chord consisting of two notes.

21a-Chord-Basic.xml



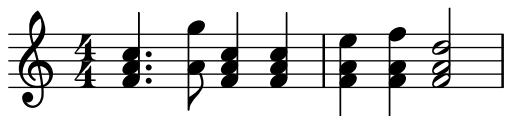
Some subsequent (identical) two-note chords.

21b-Chords-TwoNotes.xml



Some three-note chords, with various durations.

21c-Chords-ThreeNotesDuration.xml



Chords in the second measure, after several ornaments in the first measure and a p at the beginning of the second measure.

21d-Chords-SchubertStabatMater.xml



Check for proper chord detection after a pickup measure (i.e. the first beat of the measure is not aligned with multiples of the time signature)!

21e-Chords-PickupMeasures.xml



Between the individual notes of a chord there can be direction or harmony elements, which should be properly assigned to the chord (or the position of the chord).

21f-Chord-ElementInBetween.xml



## 22 ... Note settings, heads, etc.

Different note styles, using the <notehead> element. First, each note head style is printed with four quarter notes, two with filled heads, two with unfilled heads, where first the stem is up and then the stem is down. After that, each note head style is printed with a half note (should have an unfilled head by default). Finally, the Aiken note head styles are tested, once with stem up and once with stem down.

22a-Noteheads.xml



12

back slashed normal cluster none slash triangle diamond square

18

cross x circle-x inverted triangle arrow down arrow up slashed back slashed

22

normal cluster do re mi fa so

28

la ti do re mi fa so la ti do do re mi fa so la ti do

Staff-connected note styles: slash notation, hidden notes (with and without hidden staff lines)

22b-Staff-Notestyles.xml

1. slash, no stem slash, with stem normal settings restored

Different note styles for individual notes inside a chord, using the <notehead> element.

22c-Noteheads-Chords.xml

1. normal
2. cross
3. triangle
4. slash

Parenthesized note heads. First, a single parenthesized note is tested, once with a normal and then with a non-standard notehead, then two chords with some/all parenthesized noteheads and finally a parenthesized rest.

22d-Parenthesized-Noteheads.xml

## 23 ... Triplets, Tuplets

Some tuplets (3:2, 3:2, 3:2, 4:2, 4:1, 7:3, 6:2) with the default tuplet bracket displaying the number of actual notes played. The second tuplet does not have a number attribute set.

23a-Tuplets.xml



Different tuplet styles: default, none, x:y, x:y-note; Each with bracket, slur and none. Finally, non-standard 4:3 and 17:2 tuplets are given.

23b-Tuplets-Styles.xml



Displaying tuplet note types, that might not coincide with the displayed note. The first two tuplets take the type from the note, the second two from the <time-modification> element, the remaining pair of tuplets from the <tuplet> notation element. The tuplets in measure 3 specify both a number of notes and a type inside the <tuplet-actual> and <tuplet-normal> elements, the ones in measure 4 specify only a note type (but no number), and the ones in measure 5 specify only a number of tuplet-notes (but no type, which is deduced from the note's type). The first tuplet of measures 3-5 uses 'display-type=" actual"', the second one 'display-type="both"'. FIXME: The tuplet-normal should coincide with the real notes!

23c-Tuplet-Display-NonStandard.xml



Tuplets can be nested. Here there is a 5:2 tuplet inside a 3:2 tuple (all consisting of written eighth notes).

23d-Tuplets-Nested.xml



Tremolo tuplets are tuplets on single notes with a tremolo ornament. The application shall correctly import these notes with 2/3 or their time...

23e-Tuplets-Tremolo.xml



Musical notation for 23e-Tuplets-Tremolo.xml. The score is in 3/4 time and consists of two staves. The first staff contains a sequence of notes with various tuplet markings: three 3-note triplets, followed by a 3-note triplet, a 3-note triplet, a 6-note sextuplet, a 3-note triplet, a 3-note triplet, a 6-note sextuplet, a 6-note sextuplet, and a 3-note triplet. The second staff contains notes that correspond to the first staff, with a dynamic marking of *fp* (fortissimo piano) at the end.

Some " triplets" on the end of the first and in the second staff, using only <time-modification>, but not explicit tuplet bracket. Thus, the duration of the notes in the second staff should be scaled properly in comparison to staff 1, but no visual indication about the triplets is given.

23f-Tuplets-DurationButNoBracket.xml



Musical notation for 23f-Tuplets-DurationButNoBracket.xml. The score is in 4/4 time and consists of two staves. The first staff contains a sequence of notes. The second staff contains a sequence of notes, including a tremolo effect, which is visually indicated by a bracket and a '3' above the notes.

## 24 ... Grace notes

Different kinds of grace notes: acciaccatura, appoggiatura; beamed grace notes; grace notes with accidentals; different durations of the grace notes.

24a-GraceNotes.xml



Musical notation for 24a-GraceNotes.xml. The score is in common time (C) and consists of a single staff. It shows a sequence of notes with various grace notes, including acciaccaturas and appoggiaturas, and beamed grace notes.

Chords as grace notes.

24b-ChordAsGraceNote.xml



Musical notation for 24b-ChordAsGraceNote.xml. The score is in common time (C) and consists of a single staff. It shows a sequence of notes with a chord used as a grace note.

A grace note that appears at the measure end (without any steal-from-\* attribute set). Some applications need to convert this into an after-grace.

24c-GraceNote-MeasureEnd.xml



Musical notation for 24c-GraceNote-MeasureEnd.xml. The score is in 4/4 time and consists of a single staff. It shows a sequence of notes with a grace note appearing at the end of the measure.

Some grace notes and after-graces (indicated by steal-time-previous and steal-time-following).

24d-AfterGrace.xml



Musical notation for 24d-AfterGrace.xml. The score is in 4/4 time and consists of a single staff. It shows a sequence of notes with a grace note and an after-grace.

A grace note on a different staff than the actual note.

24e-GraceNote-StaffChange.xml



A grace note with a slur to the actual note. This can be interpreted as acciaccatura or appoggiatura, depending on the existence of a slash.

24f-GraceNote-Slur.xml



### 31 ... Dynamics and other single symbols

All <direction> elements defined in MusicXML. The lyrics for each note describes the direction element assigned to that note.

31a-Directions.xml

## MusicXML directions (attached to staff)

1. **A** **B** **Test** **Crc**  
 1. reh.A (def=sq.) reh.B (none) reh.Test (sq.) reh.Crc (crc.)

2. **Segno** **Coda** **Words** **Eyegl.** **p** **pp** **ppp** **pppp** **ppppp** **pppppp** **ppppppp** **f** **ff**  
 Segno Coda Words Eyegl. p pp ppp pppp ppppp pppppp f ff

5. **fff** **ffff** **mp** **mf** **sf** **sfp** **sfpp** **fp** **rf** **rfz** **sfz** **sfz** **fz** **abc-ffz**  
 fff ffff fffff ffffff mp mf sf sfp sfpp fp rf rfz sfz sfz fz abc-ffz (oth.)



9 *tr*

hairpin cresc dash - es bra - cket oct. - shift pedalchange - mark

12 ♩ = 60

*p* subito *ppp* < *fff*

Metr. Harp ped. Damp Damp all Scord. Accordion reg. subpp ppp crescto fff

Tempo Markings: note=bpm, text (note=bpm), note=note, (note=note), (note=bpm)  
 31c-MetronomeMarks.xml

♩ = 100 Adagio (♩ = 100) (♩ = 77)

### 32 ... Notations and Articulations

All <notation> elements defined in MusicXML. The lyrics show the notation assigned to each note.

32a-Notations.xml

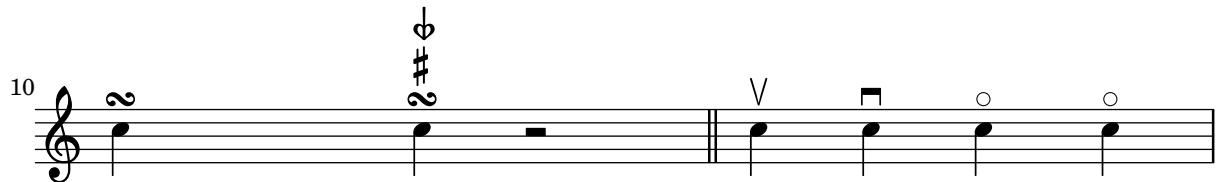
#### MusicXML notations (attached to note)

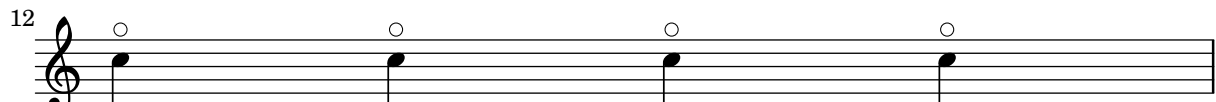
1. ferm. normal ferm. angled ferm. square ferm.

inv.ferm. arp. non-arp. acc.mark acc. str.-acc. stacc. ten.


det.-leg. stacc.ss spicc. scoop plop doit falloff breath caes. stress unstr.


tr. turn del.turn inv.turn shake wavy wavyline mord. inv.mord. schl. trem.

10  turn+acc. turn+acc.(ab.+bel./rel to turn) up-b. down-b. harm. nat.harm.

12  art.harm. nat.h./base nat.h./touching nat.h./sounding

13  open-str. thumb-pos. empty fing. fing.1 fing.2 fing.3 fing.4 fing.5

15  something fing.sth. mult.fing. empty pluck pluck a dbl.tng. trpl.tng. stopped snp.pizz.

17  empty fret fret0 empty str. str. 5 hammer - on pull - off

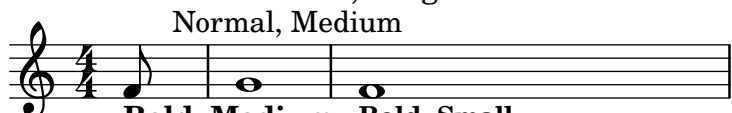
19  bend b.3 with-bar pre-b. -0.5 b. release 3.5 tap tap T heel toe

21  fingern. f ppp sfp sfffz Oth.dyn. both above ab./bel./bel.

Text markup: different font sizes, weights and colors.

32b-Articulations-Texts.xml

Normal, Small  
 Normal, Large  
 Normal, Medium  
 Bold, Medium Bold, Small  
 Bold, Large  
 Normal, Small, Colored, Below



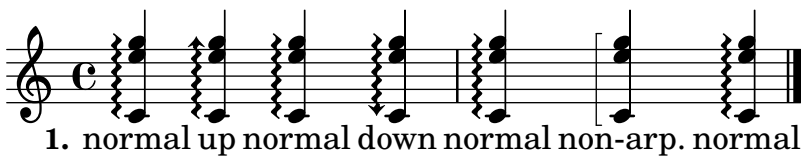
It should not make any difference whether two articulations are given inside two different notation elements, inside two different articulations children of the same notation element or inside the same articulations element. Thus, all three notes should have a staccato and an accent.

32c-MultipleNotationChildren.xml



Different Arpeggio directions (normal, up, down, non-arpeggiate)

32d-Arpeggio.xml

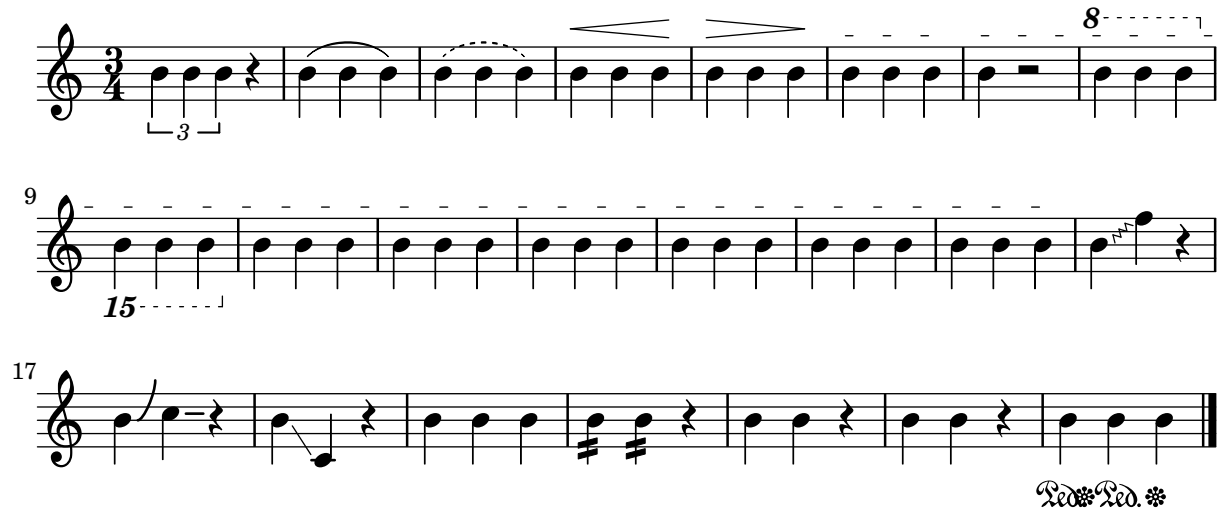


1. normal up normal down normal non-arp. normal

### 33 ... Spanners

Several spanners defined in MusicXML: tuplet, slur (solid, dashed), tie, wedge (cresc, dim), tr + wavy-line, single-note trill spanner, octave-shift (8va,15mb), bracket (solid down/down, dashed down/down, solid none/down, dashed none/up, solid none/none), dashes, glissando (wavy), bend-alter, slide (solid), grouping, two-note tremolo, hammer-on, pull-off, pedal (down, change, up).

33a-Spanners.xml



Two simple tied whole notes

33b-Spanners-Tie.xml



A note can be the end of one slur and the start of a new slur. Also, in MusicXML, nested slurs are possible like in the second measure where one slur goes over all four notes, and another slur goes from the second to the third note.

33c-Spanners-Slurs.xml



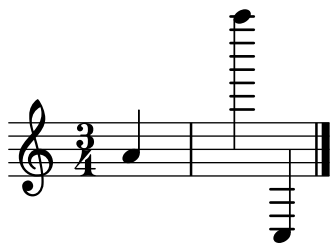
All types of octave shifts (15ma, 15mb, 8va, 8vb)

33d-Spanners-OctaveShifts.xml



Invalid octave-shifts: 27 down, 11 up.

33e-Spanners-OctaveShifts-InvalidSize.xml



A trill spanner that spans a grace note and ends on an after-grace note at the end of the measure.

33f-Trill-EndingOnGraceNote.xml



Slurs on chorded notes: Only the first note of the chord should get the slur notation. Some applications print out the slur for all notes – these should be ignored.

33g-Slur-ChordedNotes.xml



All different types of glissando defined in MusicXML

33h-Spanners-Glissando.xml



1. normal glissando solid (+text) dashed dotted wavy normal slide

4

solid (+text) dashed dotted wavy

A musical staff with a treble clef and a key signature of one sharp (F#). It contains four measures. The first measure has a solid tie between two notes. The second measure has a dashed tie between two notes, with the text "(+text)" written above the first note. The third measure has a dotted tie between two notes. The fourth measure has a wavy tie between two notes. The staff ends with a double bar line.

Several ties that have their end tag missing.

33i-Ties-NotEnded.xml

1. A B C D E

A musical staff with a treble clef and a common time signature (C). It contains five measures, each with a single note tied to the next. The notes are labeled A, B, C, D, and E from left to right. The staff ends with a double bar line.

## 41 ... Multiple parts (staves)

A piece with four parts (P0, P1, P2, P3; different from what Finale creates!). Are they converted in the correct order?

41a-MultiParts-Partorder.xml

Part 1  
Part 2  
Part 3  
Part 4

A musical score with four staves, each labeled "Part 1" through "Part 4". Each staff has a treble clef, a key signature of one sharp (F#), and a 4/4 time signature. Each staff contains a single note followed by a rest. The notes are on different lines of the staff: Part 1 (line 1), Part 2 (line 2), Part 3 (line 3), and Part 4 (line 4). The staves are connected by a brace on the left.

A piece with 20 parts to check whether an application supports that many parts and whether they are correctly sorted.

A huge orchestra score with 28 parts and different kinds of nested bracketed groups. Each part/group is assigned a name and an abbreviation to be shown before the staff. Also, most of the groups show unbroken barlines, while the barlines are broken between the groups.

The image shows a musical score for a full orchestra. The instruments are listed on the left, and their corresponding staves are on the right. The staves are grouped into two main sections: woodwinds and strings. The woodwind section includes Piccolo, Flute 1, Flute 2, Oboe, English Horn, Clarinet in Eb, Clarinet in Bb 1, Clarinet in Bb 2, Bass Clarinet, Bassoon 1, Bassoon 2, and Contrabassoon. The string section includes Horn in F 1, Horn in F 2, Trumpet in C 1, Trumpet in C 2, Trombone 1, Trombone 2, Tuba, Timpani, Percussion, Harp, Piano, Violin I, Violin II, Viola, Cello, and Contrabass. The score is written in a single system with a common time signature (C). The woodwind staves are grouped with a curly bracket on the left, and the string staves are grouped with a square bracket on the left. The woodwind group includes staves 2 through 4, and the string group includes staves 3 through 4. The woodwind group also includes staves 5 through 10, and the string group includes staves 11 through 16.

Two properly nested part groups: One group (with a square bracket) goes from staff 2 to 4) and another group (with a curly bracket) goes from staff 3 to 4.

41d-StaffGroups-Nested.xml

A musical score consisting of five staves. The first staff is a single treble clef staff. The second, third, and fourth staves are grouped together by a large left-facing curly bracket. The fifth staff is a single treble clef staff. Each staff contains three measures of music in common time (C), with a whole note in the first measure, a half note in the second, and a whole rest in the third. The score ends with a double bar line.

Part names and abbreviations can contain line breaks.

41e-StaffGroups-InstrumentNames-Linebroken.xml

A musical staff with a treble clef and common time signature. The staff contains five measures, each with a whole note. To the left of the staff, the text "Long Staff Name" is written vertically, with a line extending from the "S" to the "N" that spans the entire length of the staff.

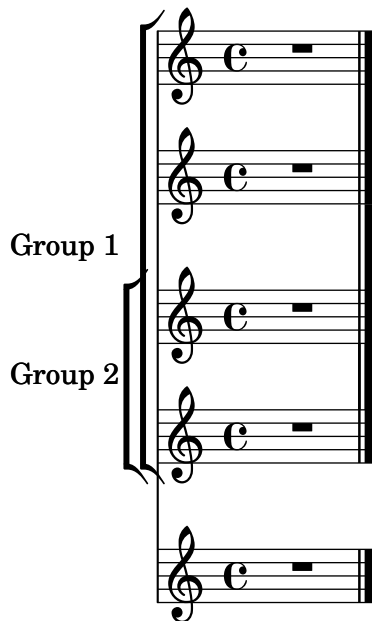
A musical staff with a treble clef and common time signature. The staff contains eight measures, each with a whole note. To the left of the staff, the text "6 St. Nm." is written vertically, with a line extending from the "6" to the "Nm." that spans the entire length of the staff.

A musical staff with a treble clef and common time signature. The staff contains eight measures, each with a whole note, followed by a whole rest in the final measure. To the left of the staff, the text "15 St. Nm." is written vertically, with a line extending from the "15" to the "Nm." that spans the entire length of the staff.

MusicXML allows for overlapping part-groups, while many applications do not allow overlapping groups, but require them to be properly nested. In this case, one group (within parenthesis) goes from staff 1 to 4 and another group (also within parenthesis) goes from staff 3 to 5.



41f-StaffGroups-Overlapping.xml



A musical score consisting of five staves. The first two staves are grouped together by a brace on the left labeled "Group 1". The next two staves are grouped together by a brace on the left labeled "Group 2". The fifth staff is not grouped. Each staff contains a treble clef, a common time signature (C), and a whole rest.

A part with no id attribute. Since this piece has only one part, it is clear which part is described by the one part element.

41g-PartNoId.xml



A single musical staff with a treble clef, a common time signature (C), and a whole rest.

This piece has more part elements than the part-list section gives. One can either convert all the parts present, but not listed in the part-list, or simply not import / ignore them.

41h-TooManyParts.xml

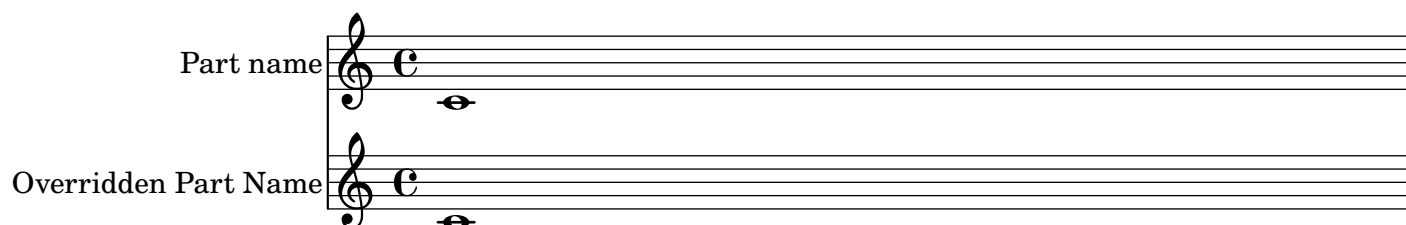


A single musical staff with a treble clef, a common time signature (C), and a whole rest.

MusicXML allows part-name and part-name-display in the score-part element. If part-name-display is given, it overrides the part-name for display.

The first staff uses only part-name, while the second one (same part-name) overrides it with a custom text. Similar for the part-abbreviation used in subsequent staves.

41i-PartNameDisplay-Override.xml



Two musical staves. The first staff is labeled "Part name" and contains a treble clef, a common time signature (C), and a whole rest. The second staff is labeled "Overridden Part Name" and contains a treble clef, a common time signature (C), and a whole rest.

This score has multiple display-text elements in its part-name-display block. This is handled without crashing.

41j-PartNameDisplay-Multiple-DisplayText-Children.xml

Player One

## 42 ... Multiple voices per staff

Two voices share one staff. Each voice is assigned some lyrics.

42a-MultiVoice-TwoVoicesOnStaff-Lyrics.xml

- 1. This is the lyrics of Voice1
- 1. This is the lyrics of Voice2

A multi-voice / multi-staff part with a clef change in the middle of a measure and a <backward> for voice 2 jumping back beyond that clef change.

42b-MultiVoice-MidMeasureClefChange.xml

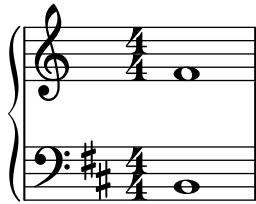
## 43 ... One part on multiple staves

A simple piano staff

43a-PianoStaff.xml

A piano staff with different keys and clefs for each of its staves. The keys and clefs for both staves are given at the very beginning of the measure.

43b-MultiStaff-DifferentKeys.xml



A piano staff with two staves. The first staff is in treble clef with a key signature of one sharp (F#) and a 4/4 time signature. The second staff is in bass clef with a key signature of two sharps (F# and C#) and a 4/4 time signature. Both staves contain a single whole note in the first measure.

A piano staff with different keys and clefs for each of its staves. The key and clef for the second staff is given only after a backward, just before the first note of the second staff is given, but after the whole measure for staff 1 has been given.

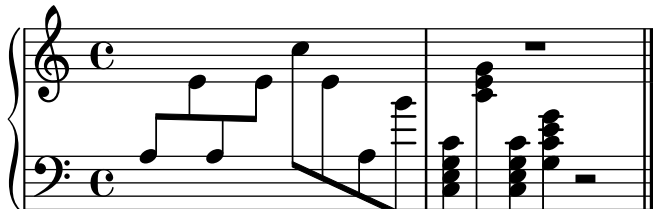
43c-MultiStaff-DifferentKeysAfterBackup.xml



A piano staff with two staves. The first staff is in treble clef with a key signature of one sharp (F#) and a 4/4 time signature. The second staff is in bass clef with a key signature of two sharps (F# and C#) and a 4/4 time signature. Both staves contain a single whole note in the first measure.

Staff changes in a piano staff. The voice from the second staff has some notes/chords on the first staff. The final two chords have some notes on the first, some on the second staff.

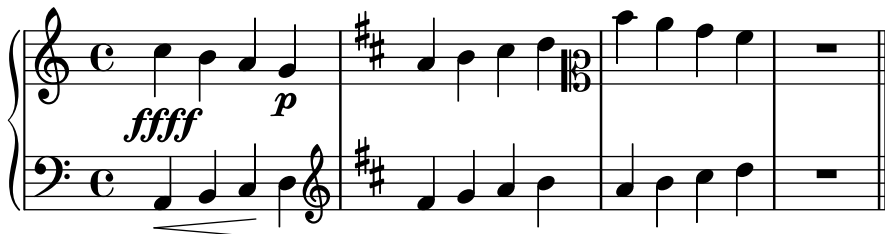
43d-MultiStaff-StaffChange.xml



A piano staff with two staves. The first staff is in treble clef with a common time signature (C). The second staff is in bass clef with a common time signature (C). The first staff contains a melodic line of eighth notes. The second staff contains a bass line of eighth notes. The piece ends with two chords, each with notes on both staves.

A piano staff with dynamics and clef changes, where each element (ffff, wedge and clef changes) applies only to one voice or one staff, respectively.

43e-Multistaff-ClefDynamics.xml

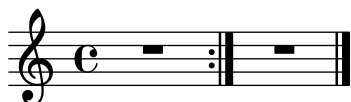


A piano staff with two staves. The first staff is in treble clef with a common time signature (C). The second staff is in bass clef with a common time signature (C). The first staff contains a melodic line of eighth notes. The second staff contains a bass line of eighth notes. The piece includes dynamics markings (ffff and p) and clef changes (treble to bass and bass to treble).

## 45 ... Repeats

A simple, repeated measure (repeated 5 times)

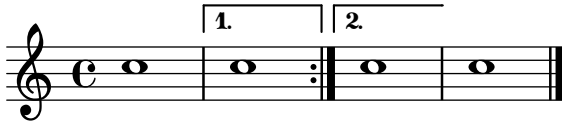
45a-SimpleRepeat.xml



A single staff in treble clef with a common time signature (C). The staff contains a single measure with a whole rest, followed by a repeat sign and another measure with a whole rest.

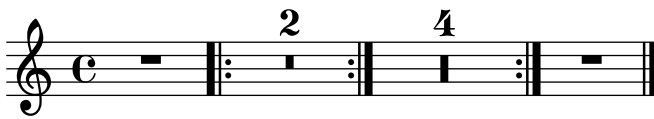
A simple repeat with two alternative endings (volta brackets).

45b-RepeatWithAlternatives.xml



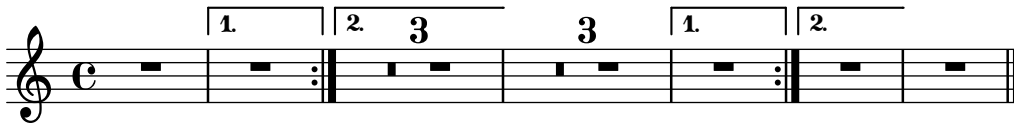
Repeats can also be nested.

45c-RepeatMultipleTimes.xml



Nested repeats, each with alternative endings.

45d-Repeats-Nested-Alternatives.xml



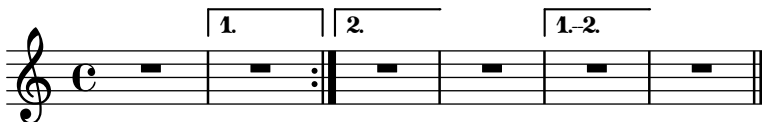
Some more nested repeats with alternatives. The barline between measure 7 and 8 will probably be messed up! (Should be a repeat on both sides!)

45e-Repeats-Nested-Alternatives.xml



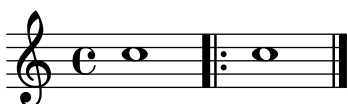
Some more nested repeats with alternatives, where the MusicXML file does not make sense in the first place. How well are applications able to cope with improper repeats and alternatives?

45f-Repeats-InvalidEndings.xml



A forward-repeating bar line without an ending repeat bar.

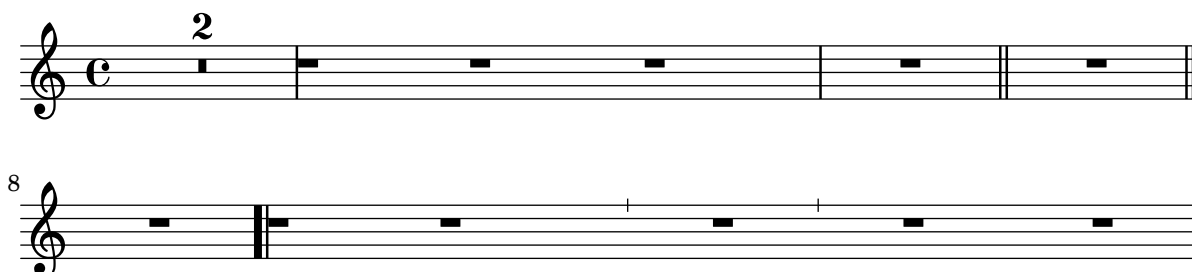
45g-Repeats-NotEnded.xml



## 46 ... Barlines, Measures

Different types of (non-repeat) barlines: default (no setting), regular, dotted, dashed, heavy, light-light, light-heavy, heavy-light, heavy-heavy, tick, short, none.

46a-Barlines.xml



Barlines can appear at mid-measure positions, without using an implicit measure!

46b-MidmeasureBarline.xml



A clef change in the middle of a measure, using either an implicit measure or simply placing the attributes in the middle of the measure.

46c-Midmeasure-Clef.xml



A 3/8 pickup measure, a measure that is split into one (incomplete, only 2/4) measure and an implicit measure, and an incomplete measure (containing 3/4).

46d-PickupMeasure-ImplicitMeasures.xml



Voice 2 should start at 2nd beat of first full measure.

46e-PickupMeasure-SecondVoiceStartsLater.xml



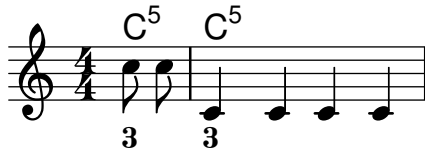
Measures can contain less notes than the time signature says. Here, the first and third measures contain only two quarters instead of four.

46f-IncompleteMeasures.xml



Pickup measure with chord names and figured bass.

46g-PickupMeasure-Chordnames-FiguredBass.xml



## 51 ... Header information

Several header fields and part names can contain quotes (" ). This test checks whether they are converted/imported without problems (i.e. whether they are correctly escaped when converting).

51b-Header-Quotes.xml

## " Quotes" in header fields

Some " Tester" Name



There can be multiple <rights> tags in the identification element of the score. The conversion shall still work, ideally using both of them.

51c-MultipleRights.xml



A piece with an empty (but existing) work-title, but a non-empty movement-title. In this case the movement-title should be chosen, even though the work-title exists.

51d-EmptyTitle.xml

## Empty work-title, non-empty movement-title

### Empty work-title, non-empty movement-title



## 52 ... Page layout

Several page layout settings: paper size, margins, system margins and distances, different fonts, etc.

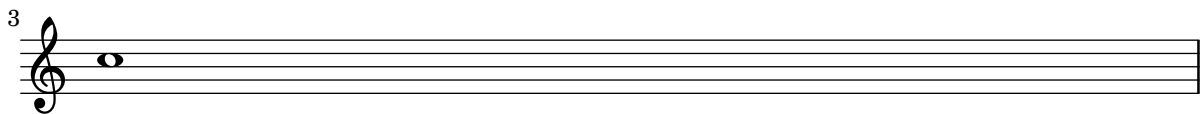
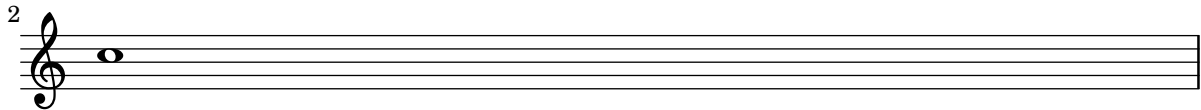
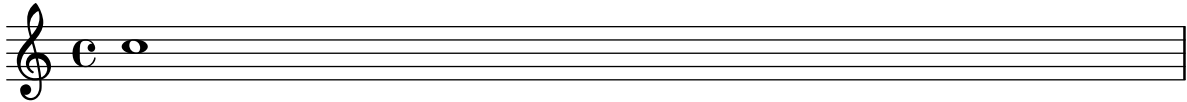
52a-PageLayout.xml

### Layout options





System and page breaks, given in a <print> element  
52b-Breaks.xml



## 61 ... Lyrics

Some notes with simple lyrics: Syllables, notes without a syllable, syllable spanners.

61a-Lyrics.xml



1. Trala-li Ja! Tra - ra! Bah!

Multiple (simple) lyrics. The order of the exported stanzas is relevant (identified by the number attribute in this test case)

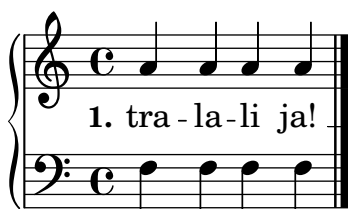
61b-MultipleLyrics.xml



1. 1.Tra-la-la, ja! — Tra - ra...
2. 2.tra - la-la, ja! — Tra - ra.
3. 3.TRALALA, JA! — TRA-RA...

Lyrics assigned to the voices of a piano staff containing two simple staves. Each staff is assigned exactly one lyrics line.

61c-Lyrics-Pianostaff.xml



1. TRALALIJA! \_

How to treat lyrics and slurred notes. Normally, a slurred group of notes is assigned only one lyrics syllable.

61d-Lyrics-Melisma.xml



1. Me - lis - ma. \_

The image shows a musical staff in treble clef with a common time signature (C). It contains four measures of music. The first measure has a quarter note G4, a quarter note A4, and a quarter note B4. The second measure has a quarter note C5, a quarter note B4, and a quarter note A4. The third measure has a quarter note G4, a quarter note F4, and a quarter note E4. The fourth measure has a quarter note D4, a quarter note C4, and a quarter note B3. The lyrics "1. Me - lis - ma. \_" are written below the staff, with hyphens under "Me" and "lis", and a period under "ma".

Assigning lyrics to chorded notes.

61e-Lyrics-Chords.xml



1. Lyrics on chords

The image shows a musical staff in treble clef with a common time signature (C). It contains four measures of music. The first measure has a quarter note G4, a quarter note A4, and a quarter note B4. The second measure has a quarter note C5, a quarter note B4, and a quarter note A4. The third measure has a quarter note G4, a quarter note F4, and a quarter note E4. The fourth measure has a quarter note D4, a quarter note C4, and a quarter note B3. The lyrics "1. Lyrics on chords" are written below the staff.

Grace notes shall not mess up the lyrics, and they shall not be assigned a syllable.

61f-Lyrics-GracedNotes.xml



1. Ly - rics on notes \_

The image shows a musical staff in treble clef with a common time signature (C). It contains four measures of music. The first measure has a quarter note G4, a quarter note A4, and a quarter note B4. The second measure has a quarter note C5, a quarter note B4, and a quarter note A4. The third measure has a quarter note G4, a quarter note F4, and a quarter note E4. The fourth measure has a quarter note D4, a quarter note C4, and a quarter note B3. The lyrics "1. Ly - rics on notes \_" are written below the staff, with hyphens under "Ly" and "rics".

A lyrics syllable can have both a number and a name attribute. The question is: What should be used to put syllables of the same voice together. This example uses different number/name combinations to check how different applications handle this unspecified case (The advice on the MusicXML mailing list was "there is no correct way, each application can do what it thinks is best").

61g-Lyrics-NameNumber.xml



1. Verse1AChorus1AAnotherChorus1A1BVerse1CChorus1D  
2. Chorus1A - 2B - Chorus2C

The image shows a musical staff in treble clef with a 6/4 time signature. It contains six measures of music, each with a single quarter note: G4, A4, B4, C5, B4, A4. The lyrics "1. Verse1AChorus1AAnotherChorus1A1BVerse1CChorus1D" and "2. Chorus1A - 2B - Chorus2C" are written below the staff.

Beaming or slurs can indicate melismata for lyrics. Also make sure that notes without an explicit syllable are treated as if they were part of a melisma.

61h-Lyrics-BeamsMelismata.xml



1. Me - lisma \_ Me - lisma \_ Me - lisma \_ Me - lisma \_

The image shows a musical staff in treble clef with a common time signature (C). It contains four measures of music. Each measure has a quarter note G4, a quarter note A4, and a quarter note B4. The lyrics "1. Me - lisma \_ Me - lisma \_ Me - lisma \_ Me - lisma \_" are written below the staff, with hyphens under "Me" and "lisma".

Each note of a chord can have some lyrics attached. In this case, each note of the chord has lyrics of the form "Lyrics [123]" attached, where each lyrics has a different number attribute to distinguish them. These syllables should be imported into three different stanzas and the timing should be correct.



61i-Lyrics-Chords.xml



1. Lyrics 1  
2.  
3.

Multiple lyrics syllables assigned to a single note are implemented either using a space in the lyrics or by using the <elision> lyrics element. This testcase checks both of them. First, a note with one syllable is given, then a note with two syllables separated by a space and finally a note with two and one with three syllables implemented using <elision> is given.

61j-Lyrics-Elisions.xml



1. a b c d e f g h

Lyrics spanners: continued syllables and extenders, possibly spanning multiple notes. The intermediate notes do not have any <lyric> element.

61k-Lyrics-SpannersExtenders.xml




1. A \_ b - CC \_ e \_

## 71 ... Guitar notation

A normal staff with several (complex) chord names displayed.

71a-Chordnames.xml

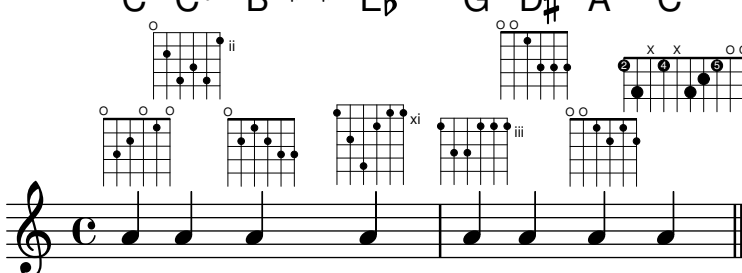
C<sup>5</sup> C<sup>lyd</sup> B<sup>7</sup> #<sup>5</sup> #<sup>9</sup> E<sub>b</sub><sup>sus2</sup> G<sup>5</sup> D<sup>#</sup> A<sup>o7</sup> A<sup>#5</sup>



A staff with chord names and some fretboards shown. The fretboards can have an arbitrary number of frets/strings, can start at an arbitrary fret and can even contain fingering information.

71c-ChordsFrets.xml

C<sup>5</sup> C<sup>lyd</sup> B<sup>7</sup> #<sup>5</sup> #<sup>9</sup> E<sub>b</sub><sup>sus2</sup> G<sup>5</sup> D<sup>#</sup> A<sup>o7</sup> C<sup>5</sup>



Chords and fretboards assigned to the voices in a multi-voice, multi-staff part. There should be fret diagrams above each of the two staves.

71d-ChordsFrets-Multistaff.xml

The image shows a musical score for a multi-staff part. At the top, there are four chord names: C<sup>5</sup>, D<sup>7</sup>, E<sub>b</sub>m<sup>9</sup>, and Cm<sup>7 11</sup>. Below these are four fretboard diagrams. The first diagram is for E<sub>b</sub>m<sup>9</sup> and is labeled with 'iv' and 'x'. The second diagram is for C<sup>5</sup> and is labeled with 'o o o'. The third and fourth diagrams are for D<sup>7</sup> and Cm<sup>7 11</sup> respectively, both labeled with 'o'. Below the diagrams are two staves of music: a treble clef staff and a bass clef staff, both in common time (C). The treble staff contains a melodic line with notes G4, A4, B4, C5, D5, E5, F5, G5. The bass staff contains a bass line with notes G2, A2, B2, C3, D3, E3, F3, G3.

Some tablature staves, with explicit fingering information and different string tunings given in the MusicXML file.

71e-TabStaves.xml

The image shows a set of tablature staves for various instruments. The instruments are listed on the left: Guitar (four staves), Bass Guitar (two staves), Banjo (two staves), Lute (two staves), and Ukulele (two staves). Each instrument has two staves labeled 'A' and 'B'. The tablature consists of two measures. The first measure has a pickup (P) and a fret number (F) above the staff. The second measure has a fret number (F) above the staff. The strings are numbered 1 to 6 from top to bottom. The fret numbers are: Guitar 1: A (17), B (1); Guitar 2: A (4), B (1); Guitar 3: A (1), B (2); Guitar 4: A (4), B (5); Bass Guitar: A (0), B (0); Banjo: A (3), B (0); Lute: A (4), B (1); Ukulele: A (4), B (24).

All chord types defined in MusicXML. The staff will only contain one c' note (NO chord) for all of them, but the chord names should be properly printed.

71f-AllChordTypes.xml

## All MusicXML chord names/types with <root>

1. major      minor      augmented      diminished

2. dominant      major-seventh      minor-seventh      diminished-seventh

3. augmented-seventh      half-diminished      major-minor      major-sixth

4. minor-sixth      dominant-ninth      major-ninth      minor-ninth

5. dominant-11th      major-11th      minor-11th      dominant-13th

6. major-13th      minor-13th      suspended-second      suspended-fourth

7. Neapolitan      Italians      French      German      pedal      power      Tristan      other

9. Inversion      F $\flat$ /C G $\sharp$ /D $\sharp$       C $^5$       C $^{\flat 5}$       G $^{\text{sus}2}$   
 F $\flat$ /C G $\sharp$ /D $\sharp$       C      C-3+5 $\flat$

There can be multiple subsequent harmony elements, indicating a harmony change during a note

71g-MultipleChordnames.xml

A musical staff in 4/4 time with a treble clef. The notes are C4, E4, G4, and B4. Above the staff, the chord names C<sup>5</sup>, F#m<sup>6</sup>, Dm<sup>7</sup>, and G<sup>7</sup> are written above the notes C, E, G, and B respectively.

## 72 ... Transposing instruments

Transposing instruments: Trumpet in Bb, Horn in Eb, Piano; All of them show the C major scale (the trumpet with 2 sharp, the horn with 3 sharp).

72a-TransposingInstruments.xml

Three staves of musical notation. The top staff is labeled 'Trumpet in Bb' and has a key signature of two sharps (F# and C#). The middle staff is labeled 'Horn in Eb' and has a key signature of three sharps (F#, C#, and G#). The bottom staff is labeled 'Piano' and has a key signature of no sharps or flats. All three staves show the C major scale (C, D, E, F, G, A, B) in a single measure.

Various transposition. Each part plays a c'', just displayed in different display pitches. The second-to-last staff uses a transposition where the displayed c' is an actual f''' concert pitch. The final staff is an untransposed instrument.

72b-TransposingInstruments-Full.xml

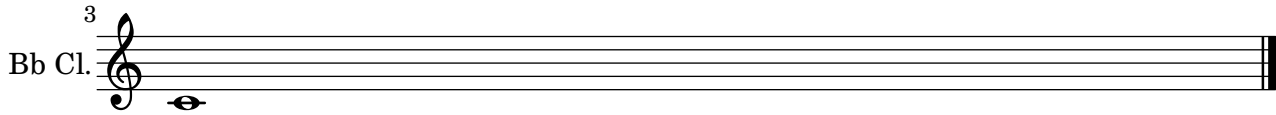
The image shows a musical score for ten different instruments, each on a separate staff. The instruments and their key signatures are: Clarinet in Eb (three sharps), Clarinet in Bb (two sharps), Clarinet in A (one flat), Horn in F (two sharps), Horn in Eb (three sharps), Piccolo Trumpet in A (one flat), Trumpet in Bb (two sharps), Trumpet in C (one sharp), Trumpet in D (one flat), and a staff labeled 'displayed c'=fis''' with a key signature of five sharps. Each staff contains a single note on a whole rest, followed by a double bar line.

An instrument change from one transposition (Clarinet in Eb) to another transposing instrument (Clarinet in Bb). The displayed instrument name should also be updated.

The whole piece is in Bb major (sounding), so first the key signature should be one flat, after the change it should have no accidentals.

72c-TransposingInstruments-Change.xml

The image shows a musical score for a Clarinet in Eb. The staff starts with a key signature of one sharp (F#) and a common time signature (C). The first measure contains a whole note on the second line (F#). The second measure contains a whole note on the second line (F natural), indicating a key signature change to no accidentals. The staff ends with a double bar line.



### 73 ... Percussion

Three types of percussion staves: A five-line staff with bass clef for Timpani, a five-line staff with percussion clef, and a one-line percussion staff with only unpitched notes.

73a-Percussion.xml



### 74 ... Figured bass

Some figured bass containing altered figures, bracketed figures and slashed figures. The last note contains an empty <figured-bass> element, which is invalid MusicXML, to check how well applications cope with malformed files.

Note that this file does not contain any extenders!

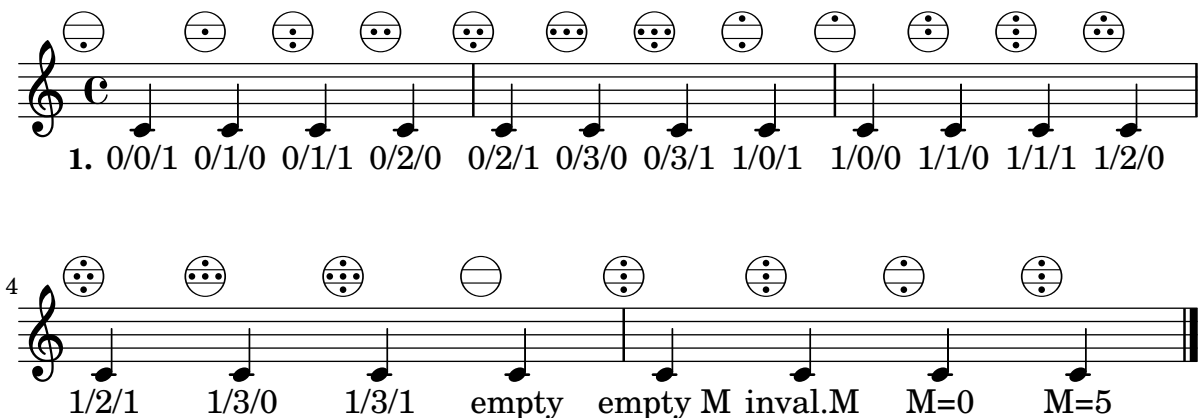
74a-FiguredBass.xml



### 75 ... Other instrumental notation

All possible accordion registrations.

75a-AccordionRegistrations.xml



## 90 ... Compressed MusicXML files

A compressed MusicXML file, containing a simple MusicXML score and the corresponding .pdf output for reference.

90a-Compressed-MusicXML.mxl

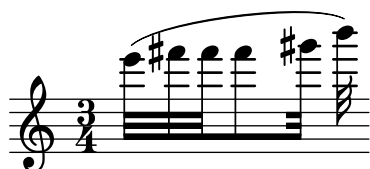
### Compressed MusicXML file



## 99 ... Compatibility with broken MusicXML

Dolet 3 for Sibelius (5.1) did not print out any closing beam tags, only starting and continuing beam tags. For such files, one either needs to ignore all beaming information or close all beams

99a-Sibelius5-IgnoreBeaming.xml



If we properly ignore all beaming information from the Dolet 3 for Sibelius export file, make sure that the lyrics syllables are still assigned to the correct notes.

99b-Lyrics-BeamsMelismata-IgnoreBeams.xml

